

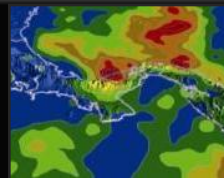
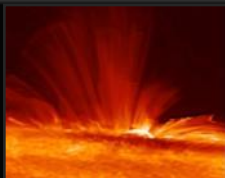


Marshall Space Flight Center

Launching the future of science and exploration

NASA Advisory Council Commercial Space Committee

marshall



Key Questions

- **How is the Agency's commercial space strategy message being perceived at the Center?**
- **What is the Center doing to promote it?**
- **What are the Center's plans for transitioning from the Shuttle and Constellation programs to the new Agency direction that includes commercial space, and how are those plans progressing?**
- **How is the Center addressing excess capacity issues?**
- **Do you have any concerns or issues with transitioning to the Agency's commercial space strategy?**

Agenda

- **Opening Remarks/Introduction**
- **Marshall Support to External Partners**
- **Facilities**
- **Michoud Assembly Facility (MAF)**

Gene Goldman

Deputy Center Director,
Marshall Space Flight Center

Teresa Vanhooser

Manager,
Flight Programs and Partnerships Office

Bob Devlin

Deputy Director
Office of Center Operations

Steve Doering

Director,
Michoud Assembly Facility (MAF)

Marshall's Core Areas

Space Transportation/Launch Vehicle Technology and Development



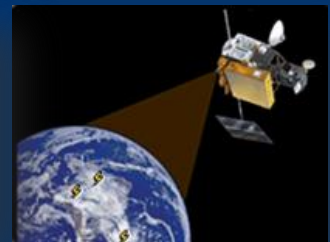
Propulsion Systems Technology and Development



Space Systems Technology, Development, and Integration

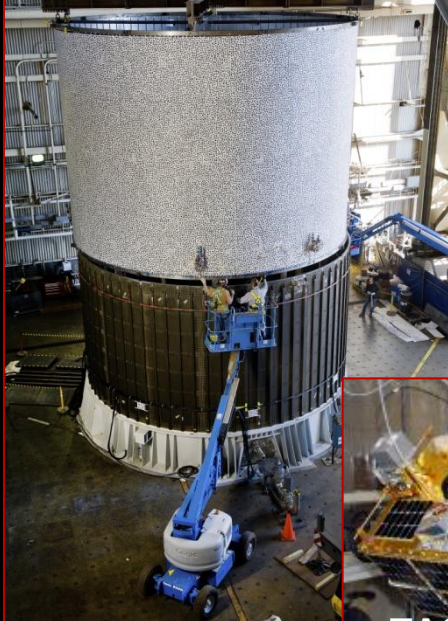


Scientific Research



Unique Capabilities & Facilities

Shell Buckling Test



X-Ray Calibration Facility



Planetary Lander Test

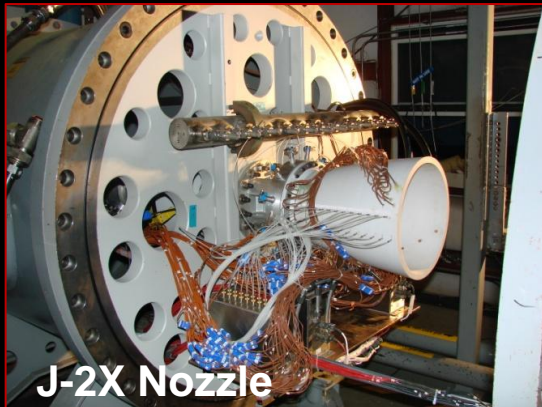


FASTAT

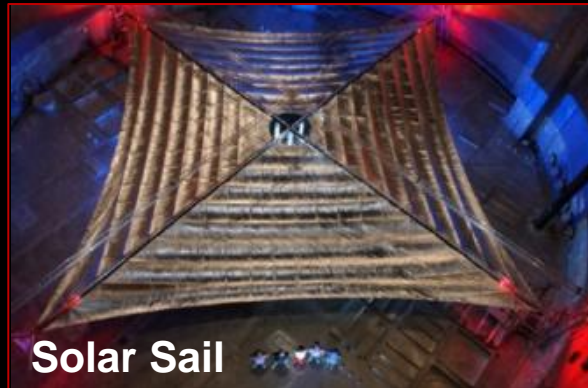
Wind Turbine Blade



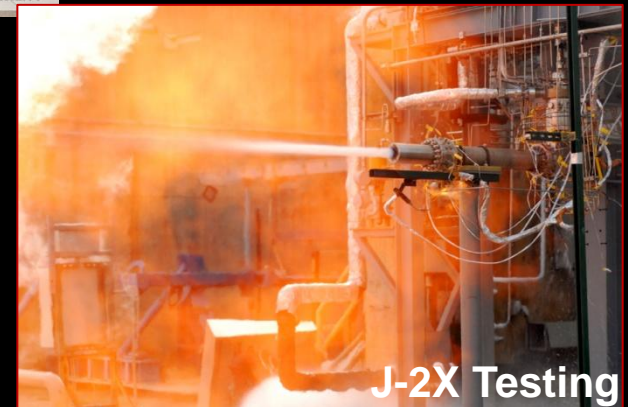
ECLSS Testing



J-2X Nozzle



Solar Sail



J-2X Testing

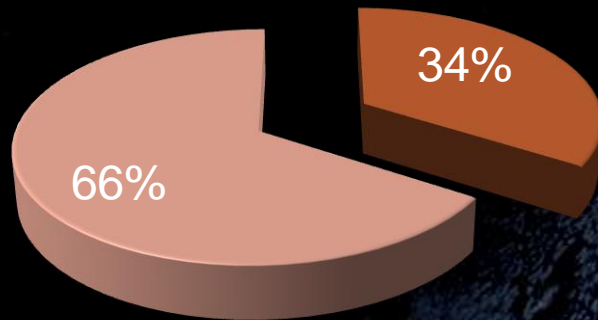
Center Transition

- As the agency transitioned from two major programs (Shuttle and Constellation) to one program (SLS), Marshall reorganized the center around new work and made adjustments to accommodate agency direction. This includes:

Contractor Workforce Reductions 2005-2011

More than 1700 contractor jobs* reduced = 34%
Constellation and Shuttle – 1500 contractor jobs
Institutional – 200+ contractor jobs

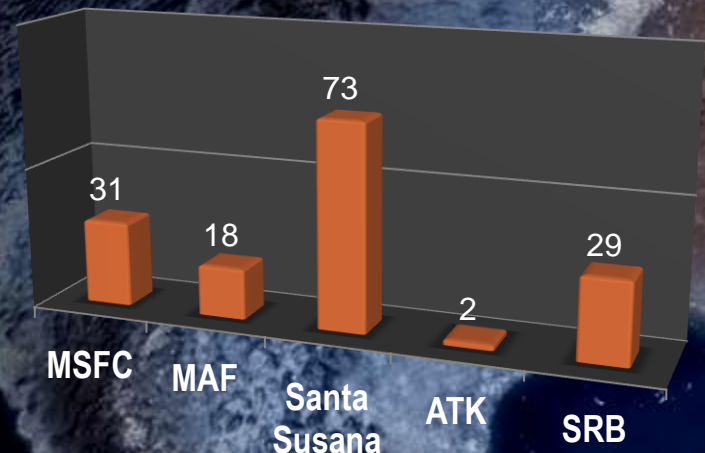
** Excludes prime contractor workforce*



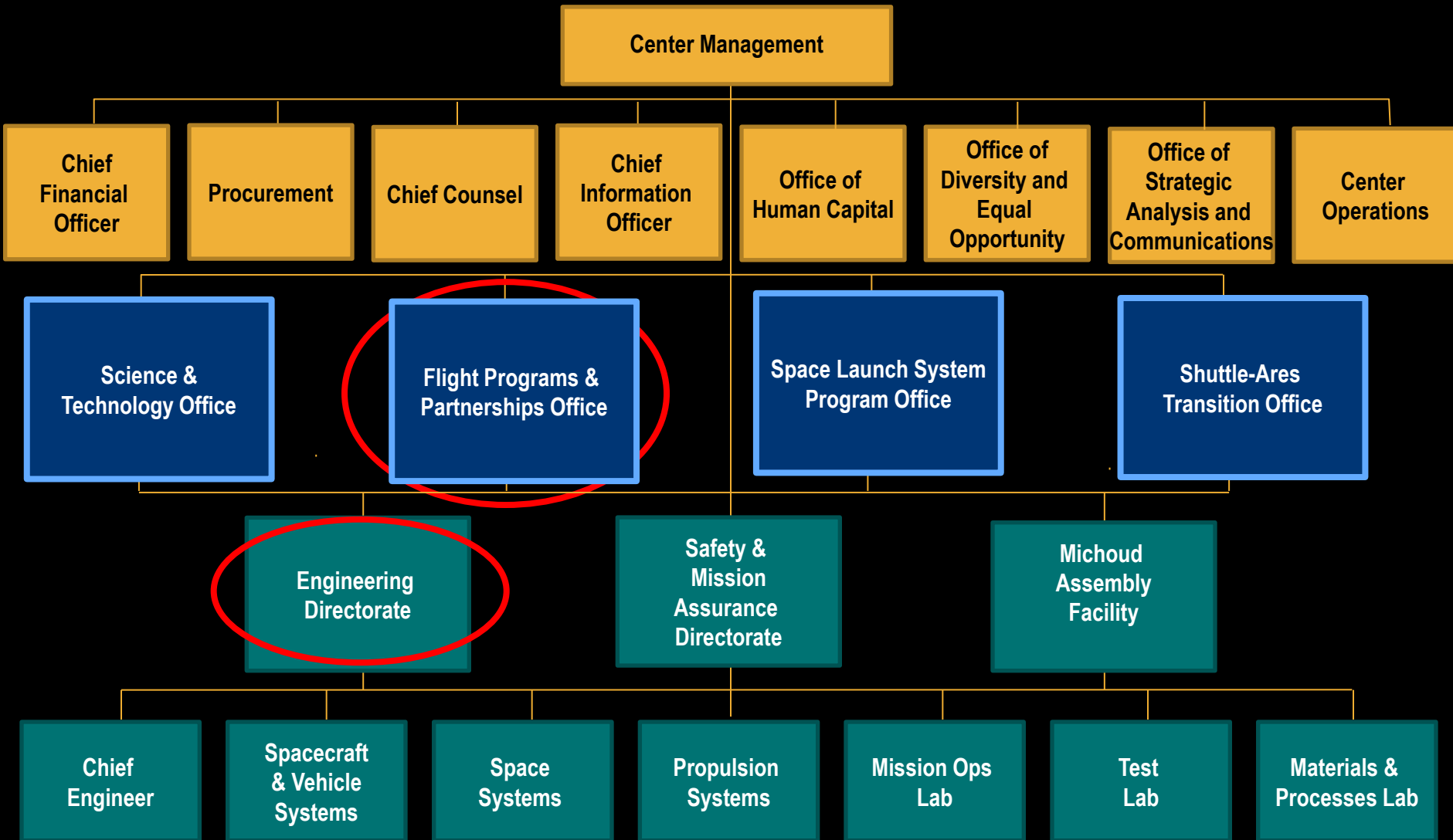
Facilities Demolished or Transferred 2005-2011

- Marshall - 31 Buildings - MAF - 18 Buildings
- SSFL - 73 Buildings - ATK - 2 Buildings
- SRB* - 29 Buildings

** Transitioned from Marshall operation; KSC owned*



New Organization



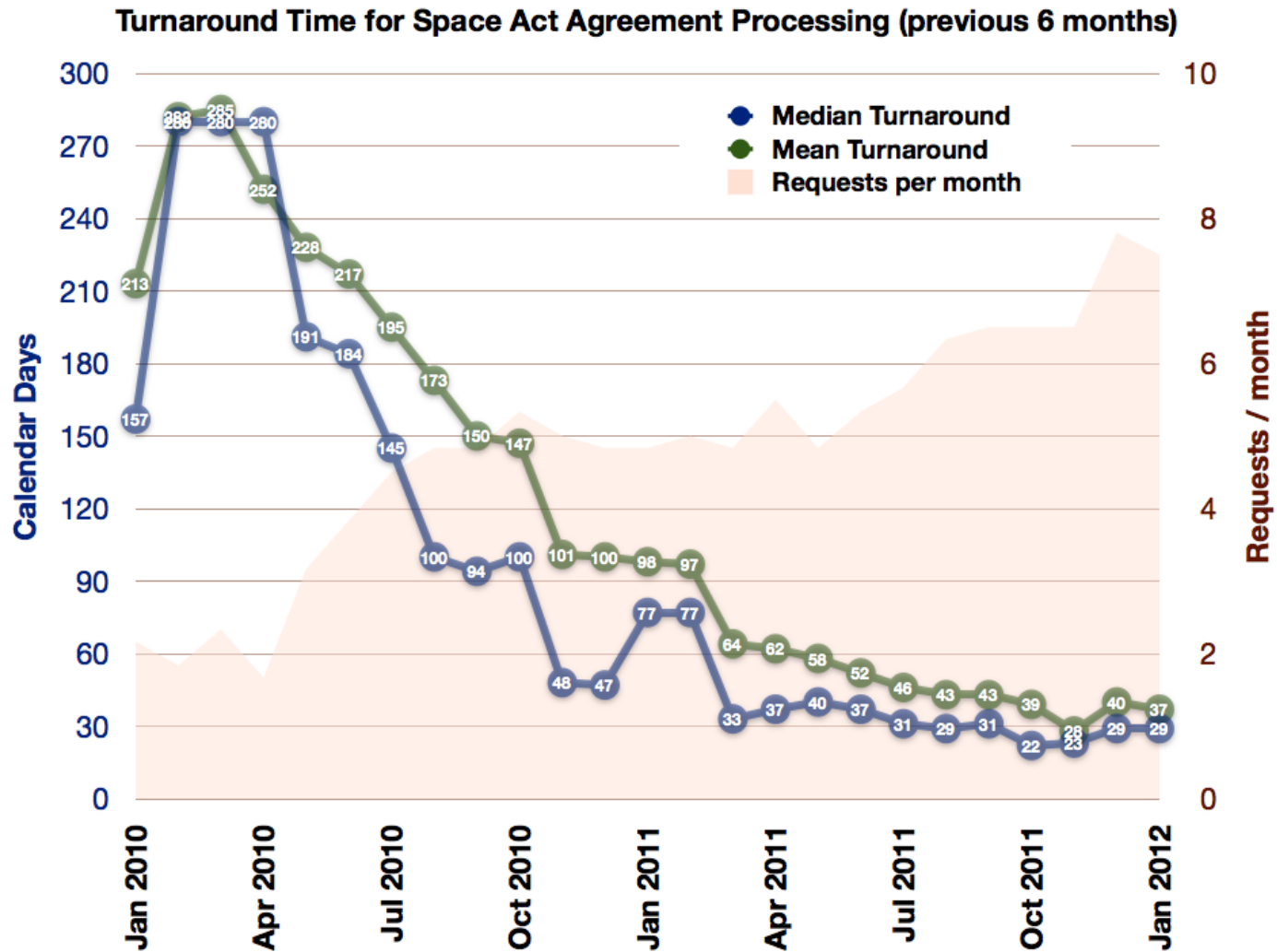
Developing Mutually Beneficial Partnerships

The Partnerships Office pairs commercial needs with Marshall's 50+ years of unique knowledge, expertise, capabilities, and specialized facilities for mutually beneficial work.

Our mission is to leverage NASA's national assets and foster productive partnerships that lead to innovations and discoveries benefiting commercial space companies, as well as government agencies and academic sectors.

- Serves as a primary interface for commercial partners
- Responsive to partner needs and integration within NASA
- Serves as a resource for the Center's capabilities, inventories and strategic plans

Responding to Commercial Needs



Marshall Capabilities of Interest to Commercial Partners

- Space Environments & Effects
- Structural and Environmental Test
- Systems Engineering, Analysis, and Integration
- Thermal Systems Design
- Guidance, Navigation, and Control
- Vehicle Development and Integration
- Mechanical, Propellants, Pressurants, and Calibration
- Damage Tolerance & Fracture Mechanics
- Fluid Dynamics
- Propulsion Systems Research, Technology, & Development
- Propulsion Testing
- Avionics and Electrical Systems
- Large-Scale Manufacturing (MAF)
- Payload Systems Technology, Development, & Integration
- ECLSS Design and Development

Investing in Our Nation's Capabilities



Stewardship: Formulate and recommend national policy options and strategies that promote a healthy industrial base.

Technology: Identify technology needs and recommend technology insertions.

Solutions Facilitator: Maintain relationships and awareness across the government and industry to align available capacity with emerging demand.

NASA's Space Launch System (SLS)

- SLS is a key part of a balanced government/commercial space exploration strategy.
- SLS is complementary to commercial Space:
 - Provides a national capability for taking astronauts further than ever before.
 - Delivers superior lift and volume for decadal-class science, reducing programmatic and technical risk through fewer launches and faster travel times.
- SLS depends on Commercial Space to deliver crew and cargo to the International Space Station outpost and to create a supply line to the far frontier.
- SLS is implementing affordability principles and strategies to deliver near-term solutions that are sustainable in the out-years.



Summary

- Marshall has adjusted the size of our workforce, technical capabilities, and facilities footprint.
 - We are aligned with Agency mission.
 - We are supporting numerous commercial efforts and collaborations across government agencies through a variety of agreements.
 - We are actively managing capability health and size to deliver on current and future missions.
-
- Next step: Address Issues/Challenges

The background of the slide is a deep space image featuring a vibrant nebula with swirling clouds of blue, purple, and red gas. Numerous small, bright stars are scattered across the dark void. A solid, bright orange horizontal line spans the width of the slide, positioned just above the first line of text.

Teresa Vanhooser, Manager, Flight Programs and Partnerships Office

Supporting Commercial Partnerships

Marshall's Commitment to Commercial Partnerships

- Marshall has over 200 ongoing collaborative agreements that leverage our unique experience in propulsion, space systems, science, and operations capabilities.
- Marshall's Center Director demonstrated his support to NASA's Partnerships initiative by instituting a Center re-organization that clearly identifies an entry point for external customers.
- Marshall and NASA Headquarters' goals are aligned, focusing on transfer of NASA technologies, capabilities, and assets to support the growing commercial space industry.

Mutual Partnership Benefits

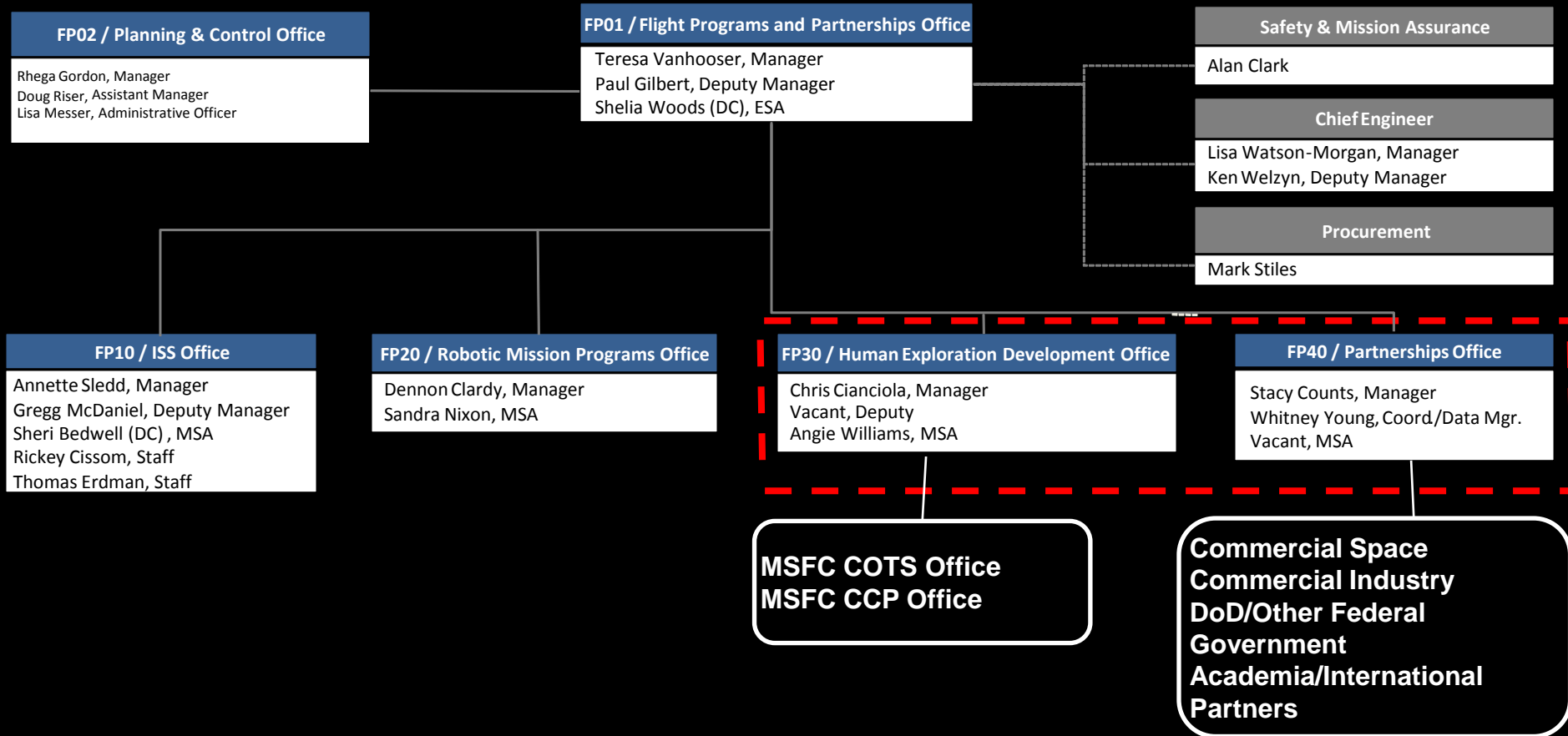
Benefits to Commercial Partners

- Access to capabilities and facilities that companies don't want to duplicate
- Access to experts in their fields
- Multiple mechanisms to enter into partnerships
- Redstone/Huntsville location – Aerospace community benefit

Benefits to Marshall

- Utilization of our facilities and capabilities to support commercial partners.
- Enhanced knowledge and skills that support Marshall's core competencies.
- Broaden team's experience in working with commercial businesses; development and maintenance of long-term relationships; and understanding industries' business environment to better support customer needs.

Flight Programs and Partnerships Office



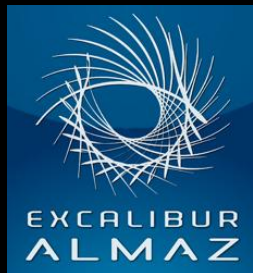
Marshall Commercial Orbital Transportation Services (COTS) Office

The SpaceX logo, consisting of the word "SPACEX" in a blue, sans-serif font, followed by a stylized grey swoosh that curves upwards and to the right.The Orbital logo, featuring the word "Orbital" in a red, italicized, sans-serif font, with a red swoosh that curves around the letters.The Aerojet logo, featuring the word "AEROJET" in a bold, black, sans-serif font, with a red swoosh that curves around the letters.

Commercial Crew & Cargo Program Office

- Provide Marshall Engineering & Project Management functions for the Commercial Crew and Cargo Program COTS Office.
- Responsible for planning, coordination, or conduct of aerospace research, development, design studies, and testing of space systems and technologies related to COTS program industry partners.
- Provide technical expertise and lessons learned for the resolution of issues on all aspects of development and operation, including system performance, configuration, component definition, operational capabilities, reliability, and safety.
- This role is in direct support of the Johnson Space Center Commercial Crew & Cargo Program Office (C3PO)

Marshall Commercial Crew Program (CCP) Office



Commercial Crew Program

- Responsible for engineering & project management functions for the Commercial Crew Program Office (CCPO), activities such as providing technical and programmatic expertise; planning, development, analysis, and resource management.
- Provide an engineering and programmatic support effort to the CCP. Specific support has been to the CCP Launch Vehicle (LV) Systems Teams and the CCP Partner Integration Teams.
- Provide a Launch Vehicle (LV) Systems Lead representing the LV Systems office at CCP Reviews and Milestones for each partnership arrangement.
- Provide leadership and support to further Commercial Crew Program (CCP) efforts to establish a CCP support infrastructure within Marshall, and help align the team with the engineering and programmatic needs and expectations of the CCP.
- This role is in direct support of the Kennedy Space Center Commercial Crew & Cargo Program Office (C3PO)

Work Resulting From COTS/C3PO Support



SpaceX Reimbursable Space Act Agreement (RSAA)

- Marshall provides direct technical support, as requested
- Current support includes materials engineering expertise and welding process development and support/lessons learned on Reaction Control Systems to SpaceX.



OSC RSAA

- Marshall provides direct technical support, as requested
- Support includes materials engineering, welding process development, engine analysis and non-destructive evaluation development.



Aerojet RSAA

- New RSAA in work to provide technical support, as requested.



Sierra Nevada RSAA

- Marshall provides direct technical support, as requested
- Current support includes technical support and use of Marshall wind tunnel facilities.

Partnerships Office Activities

- Maintain relationships with commercial and other external partners to ensure each is getting the facilities and capabilities requested.
- Provide information to partners on how the process works, and getting them in touch with the appropriate technical personnel.
- Collaborate with Marshall Institutional Offices to facilitate the development of new, or updated, agreements.
- Track the status of agreements to respond to issues quickly and to resolve issues.
- Support Industry Day events and to help Partners understand capabilities available to them at Marshall and other NASA Centers.
- Establish a Website for community access to news releases, collaboration events, and Partnerships material and organizational contacts.

Commercial Space Partners*

- ATK
- Blue Origin
- Ball Aerospace
- Orbital Sciences
- TBE
- Sierra Nevada
- Space Ops
- Aerojet
- Virgin Galactic
- Virgin Galactic
- PWR
- ULA
- Dynetics
- Space X
- Lockheed Martin
- SAIC
- Northrop Grumman
- Boeing

** Partners we have active agreements with or that we have discussed developing agreements with.*

Support to Commercial Space

- Access to Shuttle Hardware
- Access to Ares Software
- Loan of Ground Support Equipment (GSE)
- Facility Lease/Use
- Wind Tunnel Testing
- Structural Test Article & Testing
- Manufacturing
- Propulsion Technology Development
- Engine Testing
- Combustion and Test Bed Technology
- SIL/Hardware-in-the-Loop Testing
- Nitrous Compatibility Testing
- Multi-Layer Insulation (MLI) Testing
- Expertise in:
 - Composites
 - Propellants & Propulsion Technologies
 - Engine design and test
 - Hybrid Motors
 - RCS Thruster

Summary

- Marshall is making it easier for commercial partners to gain access to our capabilities, facilities and expertise.
- Marshall is committed to maintaining the capabilities that support our core competencies.

Facilities

Bob Devlin, Deputy Director, Office of Center Operations

**Space Transportation/
Launch Vehicle
Technology, Development,
& Sustainment**



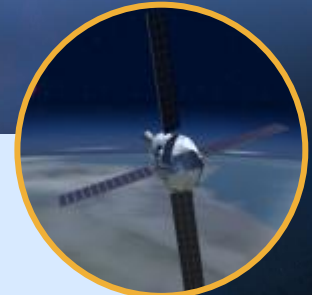
**Propulsion
Technology,
Development,
Sustainment**



**Space Systems
Technology,
Development, &
Sustainment**



**Scientific
Research**



Who we are.....

4 Core Products

- Space Transportation/Launch Vehicle Technology, Development, & Sustainment
- Propulsion Systems Technology, Development, & Sustainment
- Space Systems Technology, Development, & Sustainment
- Scientific Research

• 26 Core Capabilities

• 67 Center Technical Capability Elements

(NTC Database Level)

Core Capabilities	Core Products			
	SPACE TRANSPORTATION/ LAUNCH VEHICLE TECHNOLOGY, DEVELOPMENT, AND SUSTAINMENT	PROPULSION SYSTEMS TECHNOLOGY, DEVELOPMENT, AND SUSTAINMENT	SPACE SYSTEMS TECHNOLOGY, DEVELOPMENT, AND SUSTAINMENT	SCIENTIFIC RESEARCH
Advanced Concepts and Architectures	X	X	X	X
Advanced Manufacturing	X	X	X	
Avionics and Electrical Systems	X		X	
Propulsion Fluid Dynamics	X	X	X	
Guidance, Navigation, and Control	X		X	X
Damage Tolerance & Fracture Mechanics	X	X	X	
Scientific Research				X
ECLSS Design and Development			X	
Large-Scale Manufacturing (MAF)	X		X	
Materials Data Management	X	X	X	X
Materials Diagnostics, Nondestructive Evaluation, and Failure Analysis	X	X	X	
Materials Technology and Development	X	X	X	X
Mechanical, Propellants, Pressurants, and Calibration	X	X	X	X
Mission Operations			X	X
Natural Environments	X		X	X
Optical Systems Design, Development, Fabrication, & Test			X	X
Payload Systems Technology, Development, and Integration			X	X
Program/Project Management	X	X	X	X
Propulsion Systems Research, Technology, & Development	X	X		
Propulsion Testing	X	X		
Safety and Mission Assurance	X	X	X	X
Space Environments & Effects	X	X	X	X
Structural and Environmental Test	X	X	X	X
Systems Engineering, Analysis, and Integration	X	X	X	X
Thermal Systems Design	X	X	X	X
Vehicle Development and Integration	X			

Marshall NASA Technical Capabilities (NTC) Database Categories

67 NTC Database Center Technical Capability – Elements (CTC-E)
18 Skills-Based / 49 Skills and Facilities Based
~130 Facilities and Laboratories have been Mapped to the
Marshall Core Capabilities and NTC CTC-E

	MSFC Core Cap.	NTC CTC-E		MSFC Core Cap.	NTC CTC-E
Advanced Concepts and Architectures	✓	Skills	Materials Technology and Development	✓	
Advanced Manufacturing	✓		Material Mechanical Test Capability		Skills & Fac.
Advanced Manufacturing Processes		Skills & Fac.	Materials and Processes Selection, Control and Project Engineering Technology		Skills
Advanced Processing and Digital Solution		Skills & Fac.	Metallurgical Engineering		Skills & Fac.
Composite Manufacturing Develop		Skills & Fac.	Oxygen Systems Materials Evaluation & Testing		Skills & Fac.
Contamination Control		Skills & Fac.	Polymeric Materials		Skills & Fac.
Environmental, Safety, and Health Materials		Skills	Processes & Corrosion		Skills & Fac.
Welding and Manufacturing (Friction Stir Welding)		Skills & Fac.	Tribology/Metrology Lab		Skills & Fac.
Materials & Manufacturing Analysis		Skills	Hydrogen Test Capability		Skills & Fac.
Avionics and Electrical Systems	✓		Impact Test Capability		Skills & Fac.
Audio		Skills & Fac.	Mechanical, Propellants, Pressurants, and Calibration	✓	Skills & Fac.
Control Electronics		Skills & Fac.	Mission Operations	✓	Skills & Fac.
EEE Parts (includes Failure Analysis)		Skills & Fac.	Natural Environments	✓	Skills
Electrical Power Systems		Skills & Fac.	Optical Systems Design, Development, Fabrication, and Test	✓	Skills & Fac.
Electromagnetics (includes EMI Facility)		Skills & Fac.	Payload Systems Technology, Development, and Integration	✓	
Imaging Core Competency and Lab		Skills & Fac.	Electrical and Mechanical Fabrication		Skills & Fac.
Flight Software Systems		Skills & Fac.	Instrument Payload Development		Skills & Fac.
Avionics and Electrical Systems		Skills	Payload / Spacecraft Integration		Skills
Propulsion Fluid Dynamics	✓	Skills	Propulsion Systems Research and Technology	✓	
Guidance, Navigation, and Control	✓	Skills & Fac.	Propulsion Research and Technology		Skills & Fac.
Damage Tolerance & Fracture Mechanics	✓	Skills & Fac.	Propulsion Valves, Actuators, and Ducts Design and Development		Skills & Fac.
Scientific Research	✓		Propulsion Thrust Vector Control (TVC) Systems Integration and Components		Skills & Fac.
High Energy Astrophysics		Skills & Fac.	Propulsion Systems Analysis		Skills
Heliophysics & Space Weather		Skills & Fac.	Propulsion Testing	✓	
Planetary & Lunar		Skills & Fac.	Propulsion East Test Area		Skills & Fac.
Earth Climate & Water Cycle		Skills & Fac.	Propulsion West Test Area		Skills & Fac.
Applied Earth Science		Skills & Fac.	Special Test Equipment Design		Skills
Large Instrument & Optical System Testing		Skills & Fac.	Space Environments and Effects	✓	Skills & Fac.
ECLSS Design and Development	✓	Skills & Fac.	Structural and Environmental Test	✓	
Large-Scale Manufacturing	✓	Skills & Fac.	Experimental Fluids & Environmental Testing		Skills & Fac.
Materials Data Management	✓	Skills	Structural Dynamics Testing		Skills & Fac.
Materials Diagnostics, Nondestructive Evaluation, and Failure Analysis	✓		Structural Strength Testing		Skills & Fac.
Analytical Chemistry		Skills & Fac.	Thermal Systems Design	✓	Skills & Fac.
Materials Diagnostics		Skills & Fac.	Vehicle Development and Integration	✓	
Computed Tomography Lab		Skills & Fac.	Operations Support to Vehicle Design		Skills
NDE Development and Analysis		Skills & Fac.	Structural and Loads Analysis		Skills
			Aero Effects		Skills
Program/Project Management	✓	Skills	Structural and Mechanical Design		Skills
Safety and Mission Assurance	✓	Skills			
Systems Engineering, Analysis and Integration	✓	Skills			

Mapping of Facilities/Labs to CTC-Es

EXAMPLE

Mission Operations		
Huntsville Operations Support Center (4663)		S
Mechanical, Propellants, Pressurants, and Calibration		
Metrology and Calibration Laboratory (4650)		
Central Air Pumping Station (4607)		
High Pressure Water Pump and Storage Facility (4667)		
Ready Stowage Facility (4659)		
Valve and Component Laboratory (4637, 4650)		
Propulsion East Test Area		
Test Stand 116 (4540, 4553, 4541)		
Test and Data Recording Facility (4583)		
Solid Propulsion Test Facility (4520)		
Test Stand 300 (4530, 4531)		
Test Cells (4583)		
Test Stand 115		
Hot Gas Facility (4554)		
Test Facility 500 (4522)		
High-Precision Fabrication /Met Facility (4649)		
Materials Environment Test Complex (4555)		
Propulsion West Test Area		
Advanced Engine Test Facility (Mothball Status 4670)		
West Test Area Blockhouse (4674)		
Hydrogen Cold Flow Facility (4626)		
Structural Dynamics Testing		
Structural Dynamics Test Facility (4550)		
Contact Dynamics Simulation Facility (4663)		S
Vibration Lab (4619)		S
Experimental Fluids & Environmental Testing		
Air, Nitrogen, and Water Flow Facilities		
Environmental Test Chambers (4619)		S
Aerodynamic Research Facility (4732)		
Intermittent Trisonic Blowdown Tunnel (4732)		
Nozzle Test Facility (4732)		
Space Environmental Effects Facility (4605)		S
Structural Strength Testing		
Cryogenic Structural Test Facility (4699)		
X-Ray Cryogenic Facility (4718)		S
Structures and Mechanics Lab (4619)		S
Propulsion and Structural Test Facility (4572)		
Propulsion Research and Technology		
Propulsion Research and Development (4205)		S
Multi-Purpose High Bay Facility (4655)		
Propulsion Valves, Actuators, and Ducts Design and Development		
Component Development Area (4656)		S
Propulsion Thrust Vector Control (TVC) Systems Integration and Components		
Control Mechanisms and Development Lab (4656)		S
Hardware in the Loop and Hydraulics Components Labs (4205)		S

S: Shared Technical Capability Facility

The Changing Environment



Large-Scale Manufacturing (MAF)

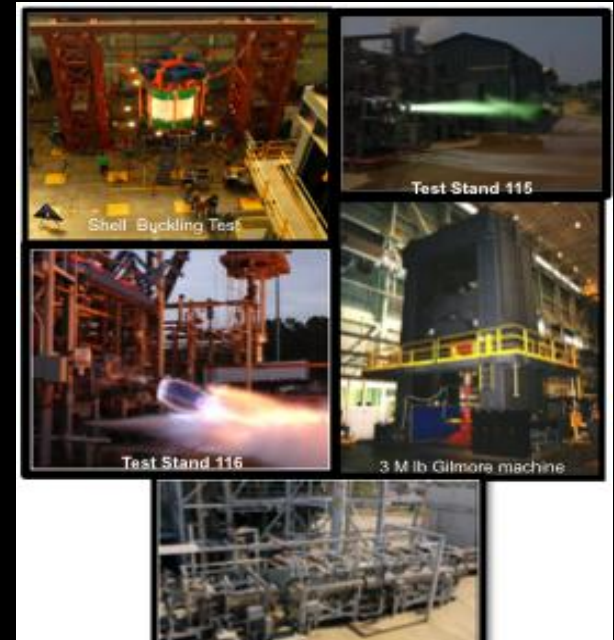
Requirements Identified Through SLS and MPCV

Significant Post-NCFII Changes



Large Instrument and Optical System Testing (XRCF)

JWST Requirements Identified Through Early FY15



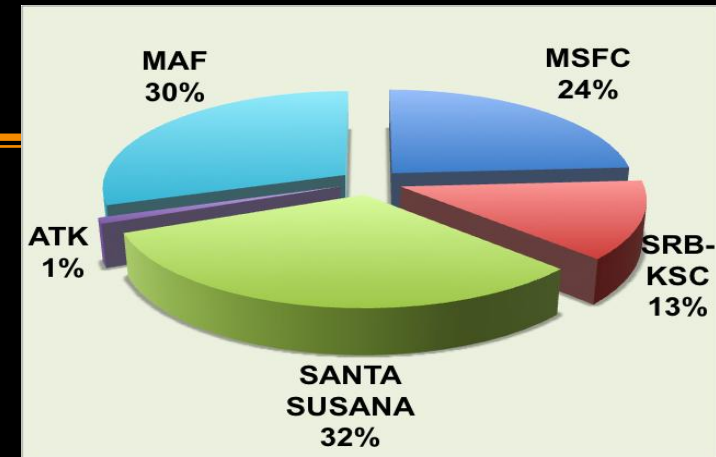
Structural, Environmental, and Propulsion Testing

New Requirements* and Mitigation Approaches Implemented

**SLS, AES, Space Technology, and Partnerships*

Marshall Facilities Activities to Adjust to Changing Missions

- 422 total buildings
- 225 Shuttle, Ares, or ISS Used Buildings
- 'Where we are Going' projections reflect:
 - 2 Sites transferring off property records
 - 33 structures for demolition
 - 39 buildings/structures placed in mothball status



Data as of 11/19/11

Site	Who We Are	Where We Have Been	Where We Are Going
Santa Susana	73 Buildings (\$117M CRV)	Excessed by Center & Agency	Taken off the Agency Property Records (~\$117M CRV)
ATK	2 Buildings (\$2M CRV)	Excess letter submitted by Center to the Agency	Taken off the Agency Property Records (~\$2M CRV)
SRB-KSC	29 Buildings	Pending transfer to KSC and CCAFS. Mothball/demolition as needed	Not on Marshall Property Records
MAF	66 Buildings (\$1,729M CRV)	FY05-10: 16 structures demolished or transferred (~\$52.7M CRV)	FY11-17: Demolition of 13 additional structures (pending adequate funding) (~\$44.9M CRV)
Marshall	252 Buildings (55 buildings primarily used by Shuttle/ISS) (\$1,852M CRV)	FY05-10: 30 buildings demolished or transferred . 11 abandon or mothballed. (~\$40.5M CRV)	FY11-17: Mothball/demolition of 39/20 structures (pending adequate funding) (~\$247M CRV)

Summary

Marshall has adjusted the size of our workforce, technical capabilities, and facilities footprint.

We are aligned with Agency mission.

We are actively managing to assess capability health and size to deliver on current and future missions

The background of the slide is a deep space image featuring a vibrant, multi-colored nebula with shades of blue, purple, and orange. Numerous small, bright stars are scattered across the dark cosmic field. A solid, bright orange horizontal line spans the width of the slide, positioned just above the first text block.

Steve Doering, Director, Michoud Assembly Facility (MAF)

MAF Update

Marshall's Michoud Assembly Facility (MAF)

- **Background**

- Unique large scale manufacturing capabilities
- Site comprises 832 acres, with over 2M square feet of manufacturing space (43 acres under one roof) and 900k square feet of office space
- Conveniently located and accessible:
 - Deep-water port
 - Less than 5 miles from intermodal rail stations and Class-One rails
 - Less than 1 mile from interstate highway
 - Convenient to lakefront airport

- **Significant state of Louisiana investment in manufacturing capability**

- **MAF transformation update**

- Single- to multi-project facility to support NASA and commercial tenants
- Established a facility Pricing Policy
- Established a third party manufacturing capability
- Reduced facility operations costs by more than 30%
- Reduced operating costs to NASA



One-of-a-Kind Infrastructure Asset

Innovative New Business Model

- **Multiple NASA Programs**

- Space Shuttle External Tank (retired)
- Ares Upper Stage(transitioned)
- Orion MPCV
- Space Launch System (SLS)

- **Turn-Key Manufacturing**

- Infrastructure
- Laboratories
- Equipment
- Support

- ♦ **Current population on-site is ~2600**

- Does not include headcount for transient work (< 1year agreement, construction, etc.)

- ♦ **Executed 12 new Space Act Agreements (SAA) with 37 mods to existing SAAs representing \$15.5M**

- Represents a direct reduction of operational costs by ~16% for FY12
- Additional SAAs and EULs in work for FY12

- **Commercial & Government Tenants**

- Lockheed Martin
- Boeing
- Blade Dynamics
- B-K Manufacturing
- Big Easy Production Company
- British Petroleum
- DNV
- USDA
- U.S. Coast Guard

mafspace.Marshall.nasa.gov

A Strong, Well-Positioned Business Partner

- Very effective economic development partnerships with local, regional, and state organizations for site development
 - 300 potential prospects over the last 2 years
 - ~75 active potential prospects in work
 - Average ~2 – 4 site visits per week
- NASA will continue to increase occupancy of existing facilities:
 - Expanding current tenants' existing footprints
 - Aggressively pursuing new tenants and strategic partners
 - Reducing site carrying cost makes MAF more affordable for NASA and tenants
- NASA capital improvement investment of \$43M
 - Harden facility against storm damage
 - Above and beyond \$67M in post Katrina repairs



Site Development – Commercial Space

Commercial Space Entity	SD Activity	Status
SpaceX	Explored Opportunities	Unsuccessful
Astrotech	Explored Comm. Satellite Business	Unsuccessful
ATK (Liberty)	Explored Opportunities	Unsuccessful
Boeing/Bigelow	Informational Discussions	Unsuccessful
C-Star Aerospace	Informational Discussions	Nothing Identified to date
Dynetics	Explored Opportunities	Unsuccessful
EADS – North American	Proposed	On-Hold due to Customer Plans
Lockheed Martin TPP	SAA EUL	Current In NASA Review (10-yr Lease)
Project Brightstar	Explored Opportunities	In-Work
Sierra Nevada	Explored Opportunities	Unsuccessful
United Launch Alliance	Explored Opportunities	Unsuccessful
Crescent Unmanned Systems	SAA	UAV Assembly and Testing
Lockheed Martin FAST-2	SAA	Composite Tank & Wing for USAF
Armadillo Aerospace	Explored Opportunities	Nothing Identified to Date

Site Development – NASA and Other Commercial

NASA Space Entity	SD Activity	Status
Boeing-SLS Stages	SAA	Planning and Manufacturing
Lockheed-Martin – Orion /MPCV	SAA	Manufacturing & Testing
Dynetics - Booster	Proposed	Pending- Advanced Booster NRA
B-K Manufacturing	SAA	Manufacturing for NASA Programs
Other Commercial Entity	SD Activity	Status
Blade Dynamics, Ltd.	SAA EUL	Current - Wind Turbine Blade Mfg Final Draft, 10-year Lease
Lockheed Martin Small Commercial	SAA	
B-K Manufacturing	SAA	Mfg for Commercial, DoD, & Tenants
British Petroleum	SAA	<i>Deepwater Horizon</i> investigation support
Longbranch Studios	SAA	Film Production - Complete
Big Easy Studios, LLC	SAA EUL	Film Production Proposal in early stages
La Center for Manufacturing Sciences	SAA	Potential DoD Manufacturing Work
Headwater, LLC	SAA	Marine Services

